



**CAMOSUN COLLEGE**  
**School of Arts & Science**  
**Department of Physics & Astronomy**

**PHYS-105-D02**  
**General College Physics 2**  
**Winter 2021**

## **COURSE OUTLINE**

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The course description is available on the web @ <http://camosun.ca/learn/calendar/current/web/phys.html>

$\Omega$  Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

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### **1. Instructor Information**

Instructor: Nancy McLean  
Mon: 10-10:20 am and 11:30-12:20 pm  
Office Hours: Tues: 9:00-9:30 am  
Thurs: 9:00-9:30 am  
Fri: 9:00-9:30 am and 11:30-12:30 pm or by appointment – just email to arrange  
Location: Remotely online via D2L ([online.camosun.ca](http://online.camosun.ca))  
Phone: N/A  
Email: [McLeanN@camosun.bc.ca](mailto:McLeanN@camosun.bc.ca)  
Website Info: D2L ([online.camosun.ca](http://online.camosun.ca))

### **2. Intended Learning Outcomes**

Upon completion of this course a student will be able to:

1. Examine common physical systems subject to periodic motion and study the propagation of waves on strings and in air columns.
  - a. Apply Hooke's Law and elastic potential energy to problems involving mass-spring systems
  - b. Define the terms period, frequency and angular frequency and evaluate these quantities for mass-spring systems and simple pendulums.
  - c. State the principal of superposition and describe the properties of waves undergoing constructive and destructive interference.
  - d. Compare and contrast wave propagation on strings and in air columns including wave speed dependence on medium characteristics.
  - e. Solve problems involving the Doppler effect and beats
  - f. State the conditions for standing waves and apply these conditions to solve technical problems of vibrating strings and air columns, including fundamental modes and harmonics.
2. Investigate laws of geometric optics and use them to solve technical problems involving refraction, reflection, and image formation (in mirrors and lenses).
  - a. State laws of reflection and refraction and apply laws to calculate paths of light rays at interfaces between materials.
  - b. Solve technical problems involving dispersion and total internal reflection as special applications of refraction.
  - c. Solve technical problems involving image formation with spherical mirrors, lenses and simple optical devices (cameras, the eye, simple magnifiers, microscopes and telescopes), including ray diagrams.
3. Apply concepts of dynamics, work and energy to analyze the behavior of charge particles in electric fields.
  - a. Calculate electric fields, forces, potential and potential energy for point charges and simple charge distributions.
  - b. Solve technical problems involving the motion of charge particles moving in uniform electric fields.
  - c. Solve technical problems involving energy storage in capacitors and combinations of capacitors.

4. Use principles of electrical energy transfer to solve problems involving multi-branch Direct Current
  - a. Apply the concept of resistivity to calculate the resistance of a resistor with specified geometry
  - b. Use Ohm's Law to determine the current flow through a resistor.
  - c. Calculate the power output of electrical devices.
  - d. Identify the characteristics of current, resistance and voltage in series and parallel circuits and apply these concepts to the analysis of multi-branch circuits involving networks of resistors and batteries
  - e. Outline the effect of internal resistance in batteries and appropriately account for its effects in circuit analysis.
  - f. Solve multi-branch electric circuit problems using Kirchoff's Laws.
  - g. Set up simple DC circuits and demonstrate the use of a multimeter to measure resistance, current and voltage.
5. Investigate the source of magnetic fields, forces on charges in magnetic fields and applications of magnetism to electromagnetic induction.
  - a. Describe the origin of magnetic fields and calculate the magnetic field produced by long wires and solenoids
  - b. Calculate the forces acting on charged particles and wire loops in uniform magnetic fields.
  - c. Describe the concept of magnetic flux, induced emf and back emf and relate these concepts to the function of electric motors and generators.
  - d. Solve technical problems involving Faraday's Law of Induction, Lenz's Law and motional emf.
6. Explore key experiments that led to the development of modern quantum theory.
  - a. Describe the photoelectric effect experiment and the photon model of light.
  - b. Solve technical problems involving energy carried by photons and the photoelectric effect.
  - c. Apply Bohr's model of the atom to solve technical problems involving energy transitions in the hydrogen atom.
7. Analyze, interpret, and report on experimental results in the context of experimental objectives.
  - a. Observe, record, organize and display data in tables, and record sources of error and determine the uncertainty in results
  - b. Plot and analyze linear graphs (determine area, slope, intercept, including uncertainties)
  - c. Convey findings in scientific reports written in an acceptable, traditional discipline-specific format

### 3. Required Materials

- (a) Texts      Physics, Principles with Applications, 7<sup>th</sup> edition, Douglas C. Giancoli  
Mastering Physics for Giancoli
- (b) Other      Scientific calculator, ruler, protractor  
 Access to a computer with Microsoft Word and Excel\*\*  
 Access to a cellphone, camera or scanner capable of generating PDF documents for submission of homework, labs, tests, etc  
 Graph paper (**must be either 10 lines/inch or millimeter graph paper**) – I will post a copy of a blank page on D2L

\*\*Word and Excel are available as part of the Office 365 suite provided free to all Camosun students. See: <http://camosun.ca/services/its/other-services.html> for details.

### 4. Course Content and Schedule

This course is designed to be delivered **half Synchronously** and **half Asynchronously**.

**Synchronous** meaning that students can access and engage with course content delivery at the set times and days of the week posted on Camlink. These **synchronous** (set time) sessions will be recorded and posted on D2L for students to access & review any time after delivery of the content.

**Asynchronous** lecture content will consist of a mixture of videos, typed lecture notes/instructions of content to read and learn and examples of problems to complete and learn both on D2L and Mastering Physics. Students are encouraged to work through the Asynchronous material, creating notes as if they were participating in a lecture and pausing to work on problems themselves. The time commitment to work through the **asynchronous** lecture content is estimated to take approximately 4.0 hours a week in addition to the Synchronous content and normal study/work time devoted to completing a course.

Labs are set up to be predominantly **Asynchronous**. Most labs consist of a virtual online introductory session delivered via Blackboard Collaborate during each lab period to guide students through the accompanied material consisting of written instructions/data to analyze/virtual labs to complete. Support for the labs will be available during the two-hour lab period or other office hours noted below. It is estimated that it will take students between 3 to 5 hours to complete each lab. Some office hours will be delivered during the lab Blackboard Collaborate synchronous sessions. Other office hours will be delivered outside of class/lab times as per the schedule below.

There will be **three synchronous** tests delivered in the lab period throughout the term and students **must be available** to write tests at those times at the dates posted on D2L.

There will be an **asynchronous quiz** delivered **each week** during the lab period available only on Mastering Physics that must be completed by the end of the lab period. All synchronous content will be delivered via D2L's Blackboard Collaborate feature.

All times below are specified in terms of Pacific Time (Pacific Daylight Time prior to Nov. 1<sup>st</sup>; Pacific Standard Time after Nov. 1<sup>st</sup>)

**LECTURE:**

Monday:	10:30 AM - 11:20 AM	Synchronous Lecture
Tuesday:	11:30 AM - 12:20 PM	Synchronous Lecture
Wednesday:	Asynchronous Lecture material delivered to complete at a time of your choosing	
Thursday:	Asynchronous Lecture material delivered to complete at a time of your choosing	

**LAB:**

Friday:	9:30 AM – 10:20 AM	Synchronous Lab/ <b>mandatory test time (on test days)</b>
Friday:	10:20 AM – 11:20 AM	Optional Office hours/ <b>mandatory test time (on test days)</b>

**OUTSIDE Class time Office Hours: (Or by appointment)**

Monday	10:00 AM – 10:30 AM and 11:30 AM – 12:20 PM
Tuesday & Thursday:	9:00 AM – 9:30 AM
Friday:	9:00 AM – 9:30 AM and 11:30 AM - 12:20 PM

**5. Basis of Student Assessment (Weighting)**

The student must be successful in both the theory ( $\geq 50\%$ ) and laboratory assignments ( $\geq 50\%$ ) to pass the course. The approximate percentages used for the final grading are:

3 Term tests	30%	(Dates and times will be posted on D2L)
Assignments (on Mastering Physics)	15%	
Quick Quizzes (on Mastering Physics)	10%	(During every lab period on Fridays)
Lab Work (1 drop lab allowed)	20%	
Final Exam (3 hours)	25%	

**Course Policies - Please carefully read the following course policies.**

Homework and Labs

Due dates for all material, including assignments, labs, texts, will be available on the course page on D2L, but in general:

- Assignments will be given throughout the term (generally weekly) and will be due by the end of the day (11:59 PM) on the posted Due Date for any particular assignment.
- Labs assigned in a particular week on Friday lab period will be due by the end of the day (11:59 PM) on the Friday of the next week. (E.g., if Lab #1 occurs during Week #1 Friday, it will be due the Friday of Week #2, etc.). Exceptions will apply when there are tests during the lab period in which case students will have a designated longer time to work on a lab. Students can access

and work on the labs after the Friday synchronous lab introductory session, with specific support for the labs available during the lab period office hours.

- Students requiring an extension to labs or homework due to illness or other extenuating circumstances **must contact me prior** to the due dates. Otherwise, late penalties will apply as noted. For overdue labs (or assignments), a late penalty of 10 % per day will be assessed for the first five days following the due date. After this, a completed lab or homework assignment earns a maximum mark of 50%.
- All late homework and lab assignments must be submitted by the last day of the term (11:59 PM on April 17<sup>th</sup>); after this point, outstanding labs & assignments will receive a mark of zero.
- Students who are repeating Physics 105 and have a lab mark from the previous attempt at the course greater than 70% can apply for lab exemption and carry over their previous lab mark. Please contact me in the first week of the term with the name of your previous instructor if this applies to you.
- Students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.

### Tests

- Tests must be completed during the specified synchronous time slot in the lab periods noted on the D2L website throughout the term and must be submitted by the end of this timeslot; students experiencing any difficulty accessing or completing the test during the specified timeslot must **immediately** contact me for assistance by email ([mcleanN@camosun.bc.ca](mailto:mcleanN@camosun.bc.ca)).
- Students who know in advance that the assigned test time will pose a problem for them (e.g., due to illness or family emergency) must contact me in advance of the test.
- Late tests received without a suitable explanation will be assigned a mark of zero.

### Submission of Assignments and Tests

- Labs, Assignments and Tests are to be submitted as a **single PDF file - ONLY one file per submission** using the Assignments drop box on D2L. **No Jpeg, Docx, Doc, Bmp or other format types for files will be marked other than PDF.**
- Assignments and Quick quizzes completed on Mastering Physics do not require a printed submission on D2L.
- Students are strongly encouraged to ensure that they are comfortable with the submission process prior to the date of first test. Students must budget their test time carefully as the time available for each test includes the time necessary for scanning and uploading of tests. **Test submissions will be subject to late penalties if outside the allowable designated time.**
- In the event of any difficulty submitting assessments to D2L, students can email me their assignment ([McleanN@camosun.bc.ca](mailto:McleanN@camosun.bc.ca)). The same time deadlines will apply to emailed submissions.

### Quizzes

- Weekly asynchronous quizzes cover lecture material.
- These quizzes will go live on Mastering Physics at the beginning of the Friday lab period (12:30 PM) of a given week and will be available until 2:20 PM of the same lab period. Quizzes can be attempted at any point during this window, but once the quiz has been started, there is a maximum 20-minute time limit.
- Quiz grades and correct quiz answers will be available for review once the cut off time for the week's quiz has passed.

### Academic Integrity

- Students in this course are subject to the Camosun College Academic Integrity Policy available at the link below and mirrored on the D2L website.  
<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf>
- You should read the above document thoroughly by the end of the first week of classes and be familiar with what constitutes academic misconduct. Failure to read this document or this course outline is not considered a valid excuse if you are found to have committed academic misconduct!
- You may also wish to consult the supporting documents on the Process for Documenting and Addressing Academic Misconduct as well as the Guide to Academic Misconduct and How to Address It.  
<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.1.pdf>  
<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.5.pdf>
- The Academic Integrity Policy and Supporting Documents provide examples of academic dishonesty. Some common examples include:
  - Communicating with classmates or other individuals during tests and quizzes
  - Posting homework, quiz, lab or test material to homework helper sites such as Chegg, Slader, CourseHero, etc...
  - Direct copying from any resources without approval of the instructor (including, but not limited to your classmates' work, online non-D2L resources, lab manual instructions, and an instructor's own posted solutions)
  - Having an individual (classmate, friend, professional tutor) complete work on your behalf
  - Sharing detailed information about tests, quizzes or assignments with students who have not yet taken the test or completed the assignment (In this case, all participating students will be penalized)
  - Copying data taken by another student in an individual lab exercise, or sharing your own data with other students.
  - Submission of any work that is not your own.

### **All students found to have committed any form of academic misconduct will be assigned an appropriate consequence as outlined in the Academic Integrity Policy.**

- Please note that student academic misconduct is documented and kept on record in the Office of the Registrar. Repeated breaches of academic integrity within this course or across courses can lead to more significant consequences per the policy and its supporting documents.
- Students are encouraged to engage with the instructor to discuss any concerns around academic integrity or violations thereof. Should a student and the instructor disagree as to the outcome of a misconduct allegation, then the student may reach out to the department Chair for support.
- I encourage you to reach out to me if you have any questions about academic integrity. You are welcome to consult with other students in working through homework problems and labs, but ultimately your final submitted work must be your own.

### Centre for Accessible Learning

- Certain students are eligible for special academic accommodations through the college's Centre for Accessible Learning (CAL). (<http://camosun.ca/services/accessible-learning/>). If you suspect that you are eligible for accommodations, please contact the Centre as soon as possible.

If you have been provided with CAL accommodations, please contact me as early as possible with your letter of accommodations.

### Science Help Center

Camosun offers the Science Help center which all students may access for assistance. The hours for the Science help Center are posted on the Camosun webpage along with the links. Below is the link:

<http://camosun.ca/services/help-centres/science-help.html#phys>

The direct link to the Physics Blackboard Collaborate room is the following:

<https://ca.bbcollab.com/collab/ui/session/guest/73edfae741bf4db493a07a75e00ebe06>

## 6. Grading System

Standard Grading System (GPA)

Competency Based Grading System

## 7. Recommended Materials to Assist Students to Succeed Throughout the Course

### STUDY TIME

It is recommended that between 5 and 10 hours per week (or more for students with a weak background) be spent studying for this course outside of class time.

### LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at [camosun.ca](http://camosun.ca).

## 8. College Supports, Services and Policies



### Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

### College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

## A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

### 1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

### 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

## B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete</i> : A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress</i> : A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal</i> : A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.